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# A contribution on the neglected milliped genus *Apheloria* Chamberlin 1921 (Diplopoda: Polydesmida: Xystodesmidae/-inae: Apheloriini): Neotype designation and description of *Julus virginiensis* Drury 1770.

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# A contribution on the neglected milliped genus *Apheloria* Chamberlin 1921 (Diplopoda: Polydesmida: Xystodesmidae/-inae: Apheloriini): Neotype designation and description of *Julus virginiensis* Drury 1770.

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**Abstract.** A trimaculate male of the diplopod genus *Apheloria* Chamberlin (Polydesmida: Xystodesmidae/-inae: Apheloriini) from 1.3 km (0.8 mi) west of McKenney, Dinwiddie County (Co.), Virginia, is designated the **Neotype** of *Julus virginiensis* Drury 1770, thereby stabilizing the earliest name for a North American milliped and authenticating its prior assignment to this taxon. The existing concept of *Apheloria* is accepted in the absence of a revisionary treatment, and a modern description of *A. v. virginiensis* with gonopod drawings and color photos is provided. Drury's original account and his letter to the Virginian who sent him the original specimens are quoted verbatim to eliminate future library searches. The specific name has been associated with at least three genera, and its confusing history is clarified by summarizing works in each. Authentic localities, mapped to the extent now possible, reveal a distribution south of the James River in piedmont and coastal Virginia that extends southwestward to the Blue Ridge foothills and at least as far south in North Carolina (NC) as Greensboro, the "Triangle" (Raleigh/Durham/Chapel Hill region), and Albemarle Sound in the east. Based on the holotypes, *A. aspila* and *A. tigana*, both by Chamberlin, are placed in synonymy under *A. v. virginiensis* (**syns. nov.**), and although its status is still under review, *A. waccamana* Chamberlin, whose type locality is Lake Waccamaw, Columbus Co., in southeastern NC, may be the correct name for today's *A. tigana*. All samples so labeled must be reexamined for misidentifications of *A. v. virginiensis*.

**Key Words.** *A. aspila*, *A. tigana*, *A. waccamana*, Dinwiddie Co., Drury, North Carolina, *Pleuroloma flavipes*, Virginia.

## Introduction

Because Thomas Say (1821) proposed 17 new species, primarily from the southern United States (US), he was considered the "father" of American myriapodology for 132 years, but he was replaced in 1953 when Hoffman and Crabill resurrected the 10 genera and species described a year earlier by Constantine Samuel Rafinesque-Schmaltz (1820). The first North American myriapod, however, the milliped *Julus virginiensis*, was proposed for a Virginia xystodesmid (polydesmidan) a half-century earlier, and only 12 years after Linnaeus (1758) established binomial nomenclature, by the British entomologist Dru Drury (1770). He mentioned a middorsal "wain*f*cot" spot on each metatergite, and as his account is difficult to obtain, we provide it verbatim below:

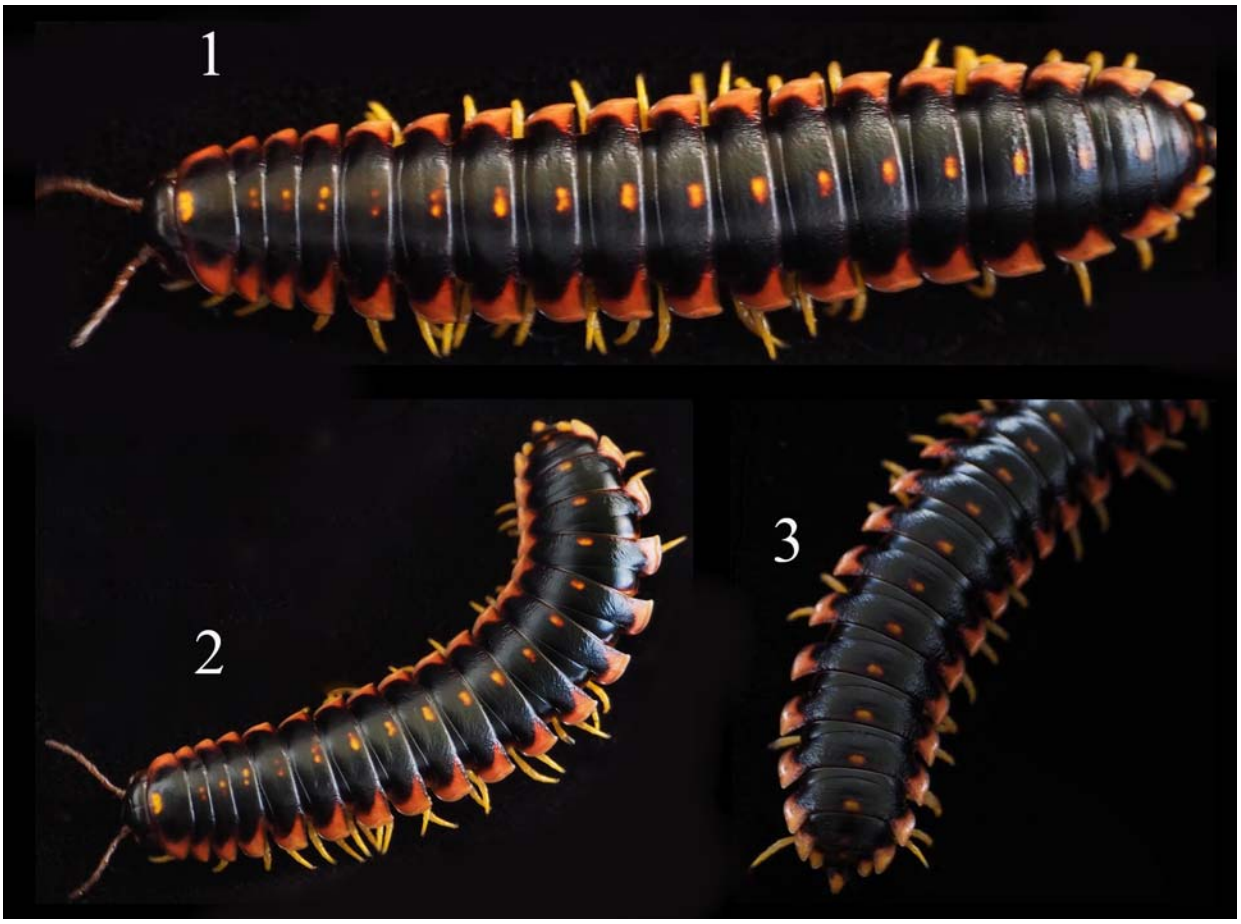
"Fig. VIII Is near an inch and an half long.
This insect is entirely wingless. – The *Head* is circular and flat, placed under the first segment or ring of the body. The *Antennae*, are composed of five equal articulations. – The *Body*, is rounding at top, forming an arch equal to one-fourth of a circle, and consists of nineteen rings or scales, that lie very closely over one another, the hinder part of one exactly fitting the fore part of the next. Each of these scales, except some, near the head, have four short feet fixed to them, the whole number of which are sixty. The general colour of the insect is a whitish gray; the under part being lighter than the upper. Along the middle of the latter, runs a darker shade, having a single spot of a wain*ſ*cot colour placed on the middle of each scale. I received it from Virginia, and have not seen it any where described."

Cockerell (1922) unknowingly restricted the location to Dinwiddie County (Co.) by publishing correspondence between Drury and the physician/botanist Dr. James Greenway, who sent the specimens and owned "The Grove" plantation near "Bolsters Store" in this county (Marek et al. 2014). In his December 18, 1770, letter, Drury thanked Greenway for the "very large *Juli*," so all we know for certain is that the shipment contained at least two individuals and that Greenway sent them; someone else may have collected them and not necessarily on that Plantation. Cockerell's (1922) excerpt from Drury's letter is quoted verbatim below:

"I must not neglect ye present opportunity [to say] that the contents of one of ye vials you sent me was a most acceptable present. It contained some uncommon Insects. I never saw any *Juli* (for such they were) so large. Permit me to beg you would save for me any of that kind you chance to meet with. I don't mean ye lizards, they are animals I don't collect, but *Insects* are my darling pursuit, therefore any that come under that denomination either large or small will meet a hearty reception."

The early taxonomic history of *virginiensis* was reviewed by Marek et al. (2014), who noted that the name had been applied to at least three xystodesmid genera in the eastern US – *Apheloria*, the correct assignment (Shelley 1980; Hoffman 1999); a genus-group component, perhaps occurring in Georgia (Gray 1832; Newport 1844a; Pocock 1909), of the *Sigmoria* mosaic (Shelley and Whitehead 1986); and *Pleuroloma* Rafinesque, an interpretation originated by Wood (1865) and followed by several authors, particularly those documenting mass xystodesmid aggregations. Forming these assemblages is a characteristic of *Pleuroloma* and particularly *P. flavipes* Rafinesque, which occurs sympatrically with most forms of *Apheloria* (Shelley 1980; Shelley and McAllister 2007). The generic-level confusion has yielded a tangled literature that we attempt to unravel by referencing works in each interpretation. Those that properly treat *virginiensis* as a species of *Apheloria* are listed in the ensuing synonymy of *A. v. virginiensis*, and those that mistakenly associate *virginiensis* with *P. flavipes* are cited in the next paragraph. The aforementioned three authors are the only ones who used *virginiensis* for a component of the *Sigmoria* mosaic, but Gray's gonopod sketch is not of an *Apheloria* and his whole-body drawing is concolorous with no marks at all. Koch (1847, 1863) cited *Fontaria coriacea*, referring to a form of *Apheloria*, from Virginia, but the whole-body color illustration in the latter is an individual with broad yellow bands along the caudal metatergal margins, so neither citation actually refers to *virginiensis*. Koch (1863) also reported *F. virginiensis* from North America in general, not Virginia specifically, but the associated illustration shows narrow, rather than broad, yellow bands and also is not *virginiensis*. These illustrations may represent banded *A. v. corrugata* (Wood), but they are not germane to the present contribution.

Though citing most prior references to a form of *Apheloria*, Wood (1865, fig. 49) assigned "*Polydesmus* (*Fontaria*) *virginiensis*" to *Pleuroloma flavipes* as his gonopod illustration clearly shows. Since he was the first author to do so, this usage is termed "Wood's concept" or "as interpreted by Wood (1865)," but he also added (p. 221–222) this important caveat: "There may be some doubt as to whether this is the species intended to be indicated in the original description of *Polydesmus* (sic!) *virginiensis*, which would apply probably equally well to several species. In the absence of any type, it has seemed better to apply the name somewhat empirically, rather than to discard it altogether." Saussure and Humbert (1872) were the first to at least partly employ Wood's concept by reporting *P.* (*F.*) *virginiensis* from Louisiana




**Figures 1–3.** Dorsal color pattern of *A. v. virginiensis*. **1)** Neotype of *J. virginiensis*, dorsal view. **2)** The same, subdorsolateral view. **3)** Caudal end of the same, dorsal view.

and "Carolina" in general. The only relevant form in Louisiana is *P. flavipes*, as *Apheloria* does not occur there (Shelley 1980; Shelley and McAllister 2007), and although it partly occupies both Carolinas, *A. virginiensis* has only been reported from northeastern North Carolina (Chowan Co.). This reasoning also applies to Attems (1899), who associated Gray's (1832) interpretation with *Fontaria virginiensis* var. *brunnea* from Louisiana and South Carolina, the trinomial being proposed by Bollman (1887) without a locality. Later, Attems (1938) cited *F. virginiensis sensu* Koch (1847, 1863), referring to banded forms of *Apheloria*, along with "*Fontaria virginiensis* Wood (nec Drury)" or *P. flavipes*. Additional papers employing Wood's concept and using *virginiensis*, usually in combination with *Fontaria*, to refer to *P. flavipes*, include Bollman (1887, 1888, 1893), Wheeler (1890), Mauck (1901), Morse (1903), and Gunthorp (1913).

The type material of *Julus virginiensis* no longer exists (Wood 1865; Hoffman 1999; Marek et al. 2014); RMS did not find it during a 1997 visit to the Natural History Museum, London, nor is the name listed in the institution's on-line Arachnida and Myriapoda database. As the oldest specific name in both *Apheloria* and Xystodesmidae (Hoffman 1999), a neotype must be designated to stabilize it and establish a foundation for further research on the genus. An initial interpretation of *virginiensis*' distribution is also needed to facilitate the second author's molecular investigations into diversity of intestinal nematodes in forms of *Apheloria*.

Beyond the nebulous identity of *virginiensis*, research on *Apheloria* is severely hampered by the lack of a revisionary treatment. The taxonomic statuses of all species-group names are uncertain, as the only generic-level contribution is Hoffman's (1999) 3½ page synoptic outline, where assignments were given without evidence and simply represented his personal opinions. The only comprehensive generic treatment is that on its distribution (Shelley and McAllister 2007), which was based on a review of

preserved samples. With these nomenclatural and taxonomic difficulties, we prefer the neutral term "form" over species or subspecies, since such statuses have not been documented with substantive evidence. Presently, there is no alternative to accepting Hoffman's (1999) concept of three component species – *A. virginiensis* (Drury 1770) with five subspecies [the nominate, *A. v. corrugata* (Wood 1864), *A. v. butleriana* (Bollman 1889), *A. v. iowa* Chamberlin 1939, and *A. v. reducta* Chamberlin 1939], *A. montana* (Bollman 1887), and *A. tigana* Chamberlin 1939 – none of which has been characterized in accordance with modern standards, and Hoffman's (1999) generalizations constitute the only distribution statements. If his concepts are valid, unnamed and undescribed subspecies of *A. virginiensis* may exist as well as new species, and documenting some of them is an objective of GP's research. The only absolute statements that can now be made are that *virginiensis*, the senior name, is a valid species and that its nominate form, if division into races is justifiable, inhabits Dinwiddie Co. We therefore designate the requisite neotype, describe its external anatomy, and estimate its distribution.

## Materials and Methods

To accomplish these objectives, GP and RMS traveled to Dinwiddie Co. on 8 July 2016 and collected around 20 individuals west of McKenney that are consistent with Drury's account and illustration; the site is approximately 16.0 km (10.0 mi) northwest of Bolsters Store. Repository acronyms are **AMNH**, American Museum of Natural History, New York, New York; **FSCA**, Florida State Collection of Arthropods, Gainesville; **MCZ**, Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts; **NCSM**, North Carolina State Museum of Natural Sciences, Raleigh; **NMNH**, National Museum of Natural History, Smithsonian Institution, Washington, DC; and **VMNH**, Virginia Museum of Natural History, Martinsville.

## Taxonomy (adapted from Hoffman (1980), Shelley (2003), and Shear (2011))

**Order Polydesmida Pocock 1887**
**Suborder Leptodesmidea Brölemann 1916**
**Superfamily Xystodesmoidea Cook 1895**
**Family Xystodesmidae Cook 1895**
**Subfamily Xystodesminae Cook 1895**
**Tribe Apheloriini Hoffman 1980**

### Genus *Apheloria* Chamberlin 1921

**Type-species.** *Fontaria montana* Bollman 1887, by original designation.

**Diagnosis.** Gonopodal acropodite configuration sickle-shaped or an incomplete loop, distal zone (Shelley and Whitehead 1986) bending abruptly (90°) sublaterad, apically acuminate; prefemoral process substantially shorter, curved/bent/elbowed at midlength and directed toward inner surface of acropodital loop, apically acuminate.

**Components.** The present concept (Hoffman 1999), which we are critically reviewing, recognizes the aforementioned three species with *A. virginiensis* divided into five subspecies.

**Distribution.** Shelley and McAllister (2007) documented that *Apheloria* extends from Montréal Island, Québec, and southern Michigan/Wisconsin to northcentral South Carolina, Alabama north of the Tennessee River, and southeastern Oklahoma. East-west, it ranges from the Connecticut River, western Chesapeake Bay, the "inner Coastal Plain" and Bald Head Island, North Carolina, and northeastern South Carolina to eastern Oklahoma and perhaps Nebraska.

**Remarks.** Chamberlin's original proposal (1921) is short but accurate – "Erected for a group of species, heretofore included in *Fontaria*, in which the telopodite of the gonopod of male is a simple, coiled blade

with a small spine (prefemoral process) at base." We cannot detect any feature other than acropodital configuration that unequivocally diagnoses *Apheloria*. Experienced workers may be able to identify some females from color pattern and/or the presence of tubercles on the ambulatory coxae, but the unique acropodital configuration is the only diagnostic structural feature.

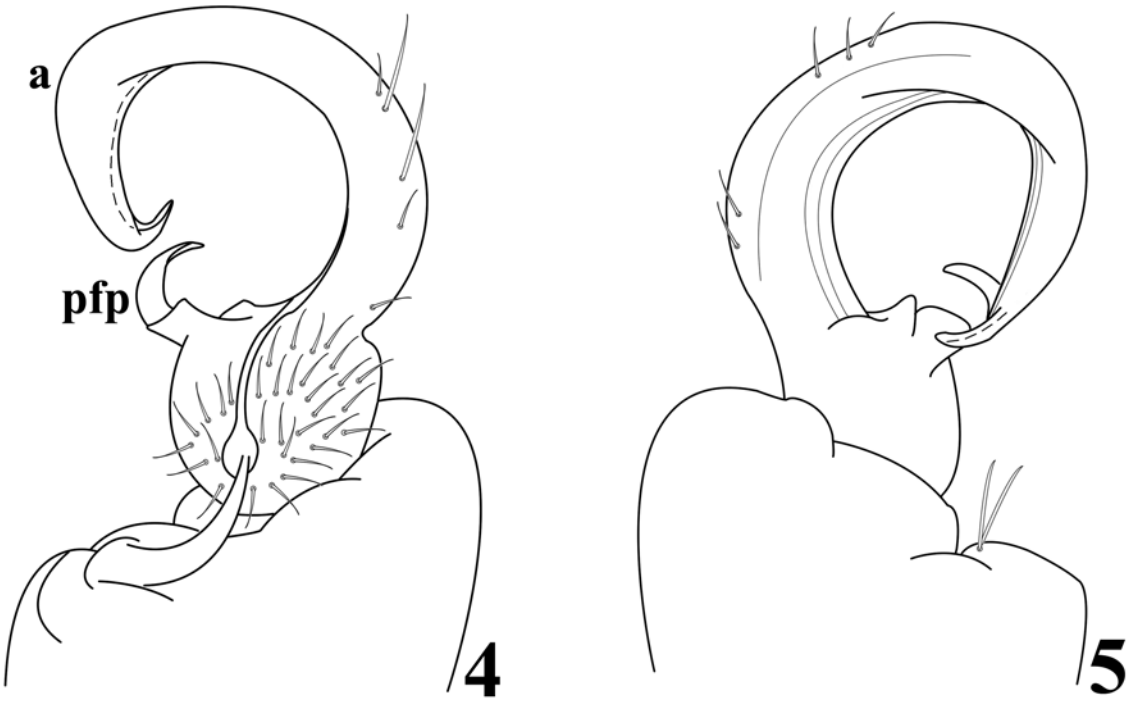
Three components of Apheloriini, as interpreted by Shelley and Whitehead (1986), exhibit broad distributions covering much of eastern North America, and *Apheloria* is the conservative counterpart to *Brachoria* and *Sigmoria*, both authored by Chamberlin. The latter are diverse, speciose, and possess highly variable gonopodal acropodites, whereas those throughout the range of *Apheloria* are closely similar and specific-level differences are obscure. We are examining subtle aspects of the acropodites and prefemoral processes for differences that may hold taxonomic significance and while no conclusions have been reached, note that the proximal 2/3 of the acropodital loops appear constant throughout the range while the sublinear distal sector seems to vary slightly in length. The "inner" margin (that inside the loop) of this sector also narrows progressively while angling toward the "outer" one, which may be a smooth, continuous taper or an abrupt slant. The length of the "distal zone," distal to the subapical bend, also varies noticeably as does the overall length and degree of curving/bending of the prefemoral process, which can even be retrorse. Perhaps morphometric studies comparable to those conducted on a Japanese xystodesmid, *Parafontaria tonominea* (Attems) (Tanabe et al. 2001), may aid in elucidating the composition of *Apheloria*, but for now we accept Hoffman's (1999) arrangement.

### ***Apheloria virginiensis* (Drury 1770)**

### ***Apheloria virginiensis virginiensis* (Drury 1770)**

Fig. 1–5

*Julus virginiensis* Drury 1770: 99, pl. 43, fig. 8. Say 1821: 107 (text).
*Polydesmus virginiensis*: Beauvois 1805: 56. Brandt 1839: 311; 1841: 131. Newport 1844b: 264. Gervais 1859: 6. Saussure 1860: 62–63.




**Figures 4–5.** Left gonopod of *J. virginiensis* neotype. **4)** Medial view. **5)** Lateral view; a – acropodite, pfp – prefemoral process.

*Polydesmus Virginiensis* (sic!): Gervais 1836. 378; 1847: 106.
*Polydesmus virginensis* (sic!): Gervais 1837: 43–44.
*Fontaria virginiensis*: Newport 1844b: 264. Bollman 1893: 123 (in part), 152. Silvestri 1896: 195. Brimley 1938: 498. Chamberlin and Hoffman 1958: 34.
*Polydesmus* (*Fontaria*) *virginiensis*: Saussure 1860: 62–64.
*Fontaria coriacea*: Brimley 1938: 498.
*Apheloria aspila* Chamberlin 1939: 10, pl. 4, fig. 31. Hoffman, 1949: 374. Chamberlin and Hoffman 1958: 18. **New Synonymy.**
*Apheloria tigana* Chamberlin 1939: 11. pl. 4, fig. 29. Loomis 1944: 173. Chamberlin and Hoffman 1958: 20. Wray 1967: 151. Shelley 1978: 63–66, fig. 62; 2000: 193. Hoffman 1999: 306. Marek et al. 2014: 8. **New Synonymy.**
*Apheloria virginia* Chamberlin 1939: 12, pl. 4, fig. 30. Wray 1967: 151.
*Apheloria coriacea*: Loomis 1944: 173. Hoffman 1949: 374.
*Apheloria virginiensis*: Shelley 1988: 1653–1654, fig. 34.
*Apheloria virginiensis virginiensis*: Hoffman 1999: 306. Marek et al. 2014: 8.

**Type-specimens.** Male neotype and 1 additional male and 1 female (FSCA), 1 male and 1 female (NMNH, VMNH), and 1 male (AMNH) collected by G. Phillips and R. M. Shelley, 8 July 2016, along VA Hwy. 40, 1.3 km (0.8 mi) W jct. VA Hwys. 40/644 in McKenney (36°59'37"N, 77°44'22"W), Dinwiddie Co., Virginia.

**New synonymies.** Hoffman (1999) placed *A. aspila* and *A. waccamana*, both authored by Chamberlin, in synonymy under *A. tigana*. He noted that *A. aspila* had page priority but chose *A. tigana* because the former's type locality — Soco Falls, Jackson Co., NC – lay outside the species' range and seemed erroneous. His reasoning was sound but unnecessary because the International Code of Zoological Nomenclature does not recognize page priority, and first reviser rights allowed him to choose either name. RMS recently examined both types; the vial label with *A. aspila* states "*Sigmoria aspila*," and the above locality is preceded by the crossed-out word, "Durham," a city in the "Triangle" (Raleigh/Durham/Chapel Hill region of central NC), ~418 km (255 mi) to the east-northeast. As the *A. aspila* and *A. tigana* types are essentially identical, we believe the former did come from Durham but Chamberlin somehow became confused and crossed it out for what he erroneously thought was the correct site. Hoffman (1999) also stated that the types of all three names had been examined, but that of *A. tigana* could only have been viewed *in situ* because the gonopods had not been dissected when RMS examined it. Though never published, Hoffman considered *A. tigana* a full species because of a short vertical projection caudal to the prefemoral process (pers. comm. to RMS in 2011). However, viewing the dissected left gonopod from several angles, RMS saw no such structure; indeed, the gonopod is virtually identical to that of the *J. virginiensis* neotype! Consequently, *A. tigana* falls in synonymy under *A. v. virginiensis* as does *A. aspila*; *A. waccamana*, whose type locality is Lake Waccamaw, Columbus Co., in southeastern NC (Fig. 6, star), may apply to the form that Hoffman considered *A. tigana*, a matter that we are investigating.

Examining gonopods *in situ* for minute details is risky because, joined together by a sclerotized sternum or sternal remnant as well as membranous connective tissue and to the body by the latter alone, the appendages cannot be rotated or fully manipulated, which can lead to errors, misinterpretations, and misidentifications. For accurate and reliable determinations, at least one gonopod should be removed from the body, examined separately, and viewed from every perspective to fully grasp its structure. Hoffman's (1999) error in considering *A. tigana* a separate species may reflect not doing so.

**Color in life (Fig. 1–3).** Epicranium, interantennal region, and frons black, fading into medium brown on clypeus and genae; antennae light brown. Prozonal and metazonal base colors dark ebony black; paranotal markings varying from pinkish-red to orange, subtriangular on collum and metaterga 2–3, extending mediad for varying lengths along caudal metatergal margins of metaterga 4–17. Collum with broad, bright yellow middorsal spot (1.3 x 0.7 mm) just caudal to anterior margin; metaterga 2–6 with small, paired, yellow middorsal spots with pinkish borders caudomediad, coalescing into one spot on 7$^{th}$ metatergum, continuing and becoming fainter caudad, nearly absent on metaterga 18/19 in some

individuals. Epiproct black basally, caudal half yellowish. Sides of metazonites reddish yellow, legs, sterna, paraprocts, and hypoproct subuniformly pale yellowish, claws dark brown.

**Diagnosis.** All but perhaps caudalmost metaterga with a small discreet single or two closely paired yellowish/pinkish middorsal spots slightly anterior to caudal margins. Gonopodal prefemoral process relatively long, broadly curved, and apically acuminate, extending into acropodital curvature and directed toward inner margin around 1/3 length, arising directly from prefemur, without nubbin-like pedicel but with basal medial flange and lateral lobe; acropodite smooth basally without one or more spurs or projections, curving broadly as described for the genus, noticeably swollen along outer margin at 2/3 length then narrowing smoothly and continuously to distal bend, distal zone moderately long, directed sublaterad, apically acuminate.

**Neotype.** Length 37.6 mm, maximum width 10.5 mm; W/L ratio 27.9%. Head smooth, glabrous; epicranial suture moderately distinct, terminating in interantennal region, not apically bifid. Interantennal isthmus 1.4 mm; genae medially impressed, ends extending beyond those of epicranium, width across genal apices 5.0 mm. Antennae extending backwards to midlength of 4$^{th}$ metatergite; 1$^{st}$ antennomere subglobose, 2–5 clavate, 6 longer and cylindrical, 7th truncate with four terminal sensory cones; 1$^{st}$–3$^{rd}$ antennomeres sparsely hirsute, 4$^{th}$ moderately so, 5$^{th}$–7$^{th}$ densely pilose; relative lengths of antennomeres 6>3=5>4>2>1>7. Facial setae as follows: epicranial, interantennal, genal, and frontal series absent, clypeal about 9-9, labral around 12-12, merging with clypeal series and extending for short distances along genal margins, 3–4 setae per side.

Metaterga generally smooth, glabrous, and glossy, distinctly coriaceous anteriolaterad at bases of paranota beginning on 4$^{th}$ tergite and becoming progressively more coriaceous caudad. Collum semilunar; metatergites 2–16 becoming slightly but progressively broader caudad. Paranota shorter than metaterga and continuing wrinkling from latter, anteriolateral margins curved, caudolateral corners slightly extended; peritermata distinct, strongly elevated above paranotal surfaces; ozopores located caudal to peritrematal midlengths on paranota 5, 7, 9–10, 12–13, opening subdorsad. Epiproct short, subtriangular, extending beyond caudal paraproctal margins, apically subacuminate.

Sides of metazona smooth, generally without grooves or impressions. Pregonopodal sterna with short, indistinct, medial lobes between 3$^{rd}$ and 4$^{th}$ legs, strongly depressed between 7$^{th}$ legs to accommodate curvatures of gonopodal acropodites when segments compressed. Postgonopodal sterna of males and all sterna of females with faint bicruciform impressions but otherwise smooth, caudal margins sublinear or gently concave, with or without small setal tufts laterad but wholly without lobes or spines. First male legs short and crassate; 2$^{nd}$ longer and subequal in length to remaining legs, gonapophyses long, prominent, and cylindrical, apices slightly flared. Postgonopodal legs becoming progressively less setose caudad; coxae with short, stubby, ventrally directed spurs, prefemoral spines longer, narrower, and directed laterad, arising on 6$^{th}$ legs, longer and more spiniform from segment 9 caudad; tarsal claws gently curved. Paraproctal margins strongly elevated and thickened; hypoproct large and prominent, semilunar, slightly extended mediad with two long, subapical setae.

Gonopodal aperture ovoid, approximately 2.6 mm wide and 1.6 mm long at midpoint, lateral and caudal margins slightly elevated above metazonum, rims smooth, not thickened or flared. Gonopods *in situ* with one appendage lying transversely in aperture, its telopodite displacing that of opposite gonopod anteriad, overhanging anterior margin of aperture. Gonopod structure as follows (Fig. 4–5): coxa relatively large with two long macrosetae, without apophysis, connected to opposite member by membrane only, without sternal remnant; prefemur substantially smaller than coxa; prefemoral process relatively long, broadly curved, and apically acuminate, extending into acropodital curvature and directed toward inner margin around 1/3 length, arising directly from prefemur, without basal pedicel but with basomedial flange and lateral lobe; acropodite smooth basally without spurs or projections, curving broadly, swollen along outer margin at 2/3 length then narrowing smoothly and continuously to distal bend, distal zone moderately long, directed sublaterad, apically acuminate. Prostatic groove arising in pit in prefemur, running generally along inner surface of acropodite to terminal opening.

**Additional specimens in neotype sample.** They all agree closely with the neotype in somatic and gonopodal features except that in two males, both gonopods lie transversely, wholly inside the aperture,

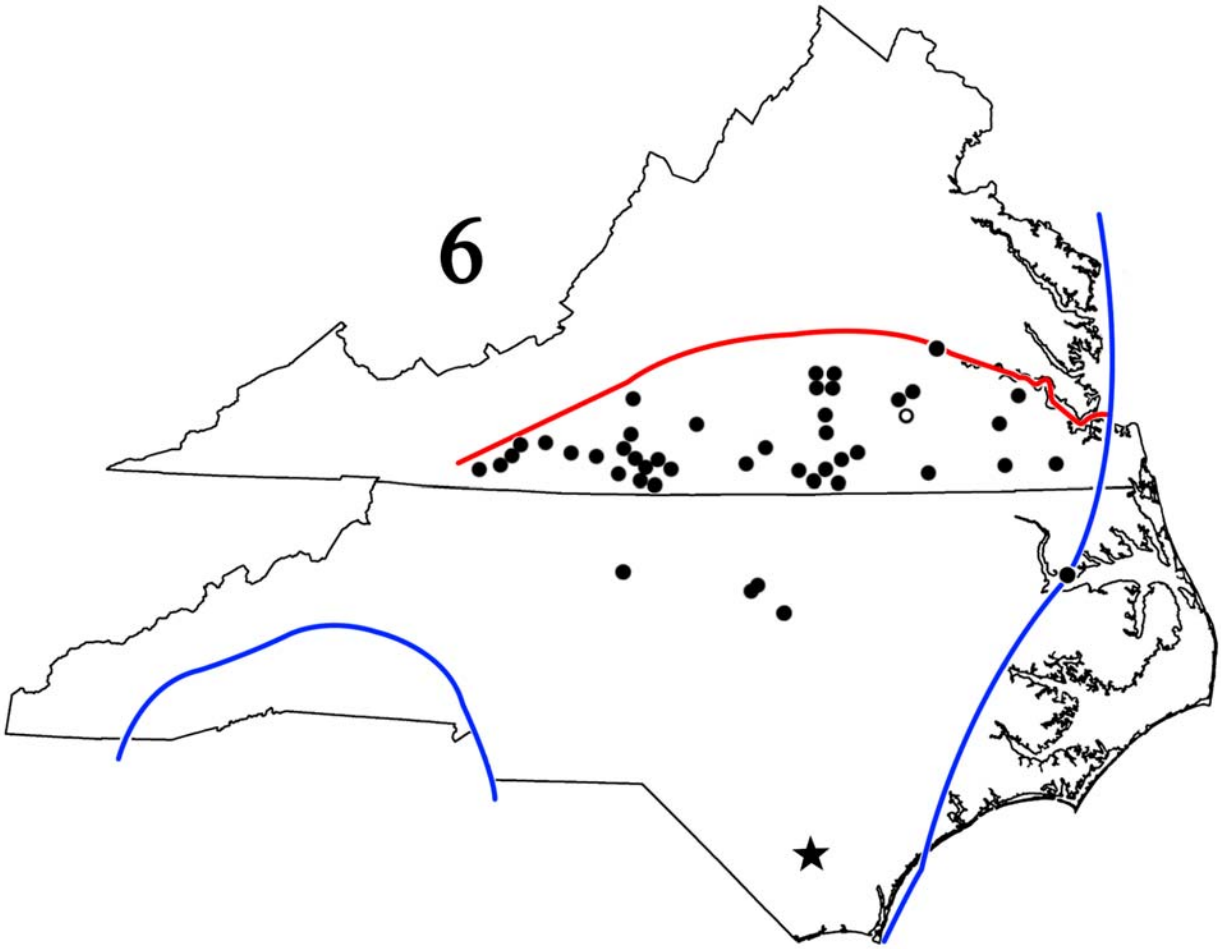



**Figure 6.** Known distribution of *A. v. virginiensis* in Virginia excepting the Eastern Shore (upper) and North Carolina (lower). Dots: authentic records. Circle: neotype locality. Star: type locality of *A. waccamana* – Lake Waccamaw, Columbus Co., NC. Red line: approximate northern distributional border of *A. v. virginiensis*. Blue lines: approximate eastern and southern boundaries of *Apheloria* (Shelley and McAllister 2007).

with each telopodite lying over the opposing coxa and interlocking with its telopodite. Morphometrics for the five males and three females are as follows: Males: Length: range 31.7–35.9 mm, mean 35.1 mm, median 33.8 mm; width: range: 9.8–10.5 mm, mean 10.2 mm, median 10.2 mm. Females: Length: range 34.4–37.6 mm, mean 36.4 mm, median 36.0 mm; width: range 10.3–10.5 mm, mean. 10.4 mm, median 10.4 mm.

**Ecology.** The specimens were found under deciduous litter on black, organic substrate in a wet, mixed wooded ravine bisected by a slowly flowing creek. The area had received rain the previous day.

**Distribution (Fig. 6).** This study confirms Hoffman's (1999) range statement of the Piedmont Plateau and inner Coastal Plain of Virginia south of the James River and extends it southwestward to the Blue Ridge foothills of Franklin, Patrick, Floyd, and Carroll Cos. and southward to the latitude of Raleigh, Wake Co., in the NC "Triangle." Its widespread occurrence in the southernmost tier of Virginia counties strongly suggests comparable occurrence in the adjacent northernmost tier of NC counties where *A. tigana* was assumed to be the only generic representative (Shelley 1978, 2000). The results of RMS' examination of its holotype necessitates that all samples so identified be reexamined; indeed, the gonopodal illustration of a Wake Co. male of, ostensibly, *A. tigana* (Shelley 1978, fig. 65–66) is really *A. v. virginiensis*. In southeastern Virginia, the nominate form, with small, discrete, metatergal spots (Fig. 1–3), seems tightly parapatric with banded *A. v. corrugata*; the former occurs south of the James River

in Surry, Sussex, Courtland, and Suffolk Cos. while the latter occurs to its north. Both forms inhabit inland Chesterfield and Carroll Cos., and west of the former, *A. v. virginiensis* curves southwestward as *A. v. corrugata* alone occupies Appomattox, Buckingham, and Cumberland Cos. Farther southwest in Bedford and northern Franklin Cos., the middorsal spots become larger and somewhat splotchy as their caudal margins spread laterad suggesting metatergal bands, and they become even more banded in northern Bedford Co. This "semi-banded" pattern arises in northern Franklin Co. and is so pronounced in Bedford that the millipeds cannot be labeled *A. v. virginiensis*; we therefore place the boundary between these counties. Perhaps *A. v. virginiensis* intergrades with *A. v. corrugata* in the Blue Ridge foothills while they are parapatric in the Piedmont and Coastal Plain. While the gonopods remain relatively constant, the spots become smaller and more discrete in Floyd and Carroll Cos., and hence compatible with those in the neotype.

The position of the southern boundary is unknown, but it is at least as far south as Greensboro, Guilford Co., the "Triangle," and, to the northeast, Albemarle Sound and Chowan Co. Though not yet found there or in southeasternmost Virginia, it seems safe to predict that only *A. v. virginiensis* occurs in the Dismal Swamp and between Albemarle Sound, NC, and lower Chesapeake Bay, Virginia. However, all samples from the northern tier of NC counties bordering Virginia and from counties immediately to the south must be reexamined; minimally, the roster includes those listed by Shelley (1978, 2000): Alamance, Caswell, Durham, Edgecombe, Forsyth, Franklin, Granville, Guilford, Halifax, Person, Rockingham, Stokes, Surry, Wake, Warren, and Yadkin. In characterizing middorsal spot variation on "Triangle" *Aphelorias*, Shelley (1978) stated, "Size and shape of the middorsal spots also vary, ranging from large, semilunar splotches to small, well-defined circles. On a few individuals, there is a progressively deeper indentation of the spot proceeding anteriorly, resulting in two small, paired middorsal spots on the anteriormost segments," precisely the condition in the neotype of *J. virginiensis* (Fig. 1–3).

**Deletions. Kentucky:** *Edmondson Co*., Mammoth Cave, presumably in epigean Mammoth Cave National Park, not inside the cave itself (Chamberlin and Hoffman 1958). **North Carolina:** *Moore Co*., Southern Pines (Brimley 1938), specimen lost but locality is south of the largest regional river, the Cape Fear, and too far [128.0 km (80.0 mi)] from the "Triangle" to be assumed to be *A. v. virginiensis* (=*A. tigana*). **Tennessee:** *Davidson Co*., Ashburnham (Chamberlin and Hoffman 1958).

**Published Records. North Carolina:** *Guilford Co*., Greensboro (Wray 1967). *Wake Co*., Raleigh (Brimley 1938). **Virginia:** *Dinwiddie Co*., exact location unknown but likely the correspondent's home, "The Grove" plantation near "Bolster's Store" (Drury 1770, Cockerell 1922, Shelley 1980, Hoffman 1999, Marek et al. 2014). *Pittsylvania Co*., Chatham (Chamberlin 1939, Wray 1967).

**Nontypical Material Examined** (missing data in the citations was not provided on vial labels).

**North Carolina:** *Chowan Co*., 13.8 km (8.6 mi) E Edenton, along SR 1100, F, 24 April 1989, J. C. Beane, M. K. Clark, P. Trail (NCSM); and 7.2 km (4.5 mi) SE Edenton, along NC hwy. 32, M, 27 May 1990, J. C. Beane (NCSM).

**Virginia:** *Carroll Co*., 6.1 km (3.8 mi) S Poplar Knob, M, 22 July 1973, R. L. Hoffman (VMNH); 9.6 km (6.0 mi) E Galax, M, 7 June 1981, D. W. Ogle (VMNH); 4.8–8.0 km (3.0–5.0 mi) E Hillsville, along US hwy 58 at Hardscrabble Creek, M, 4 June 1989, D. W. Ogle (VMNH); and Big Reed Island Creek (location unknown), M, 2 June 1990, D. W. Ogle (VMNH). *Chesterfield Co*., North Chesterfield, Scotford Road (37°28.2'N, 77°34.3'W), M, 22 May 2005, S. M. Roble (VMNH). *Dinwiddie Co*., 10.1 and 11.2 km (6.3 and 7.0 mi) NW McKenney, along VA hwys. 613 and 642 at Butterwood Creek, 3M, 5F, 2 juvs., 26 June 1978, R. M. Shelley, W. B. Jones (NCSM). *Floyd Co*., Buffalo Mountain Natural Area Preserve, MM, 3 October–13 November 2000 (VMNH); and 4.8 km (3.0 mi) SE Willis, M, 23 June 1995, J. M. Anderson (VMNH). *Franklin Co*., 16.0 km (10.0 mi) ENE Rocky Mount, Smith Mountain Lake, 2M, 17 April 1975 (VMNH), M, August 1977, J. Walke (VMNH), and M, 7–20 October 1994 (VMNH); and 3.2 km (2.0 mi) SE Snow Creek Ranch, M, August 2000 (VMNH). *Franklin/Henry Cos*., Turkeycock Mountain Wildlife Management Area, 3M, J. D. Gibson (VMNH). *Greensville Co*., 1.6 km (1.0 mi) NE Claresville, 2M, F, 10–21 June 1993 (VMNH); and 4.8 km (3.0 mi) NE Claresville, W bank of Meherrin River, 3M, 23 May 1996 (VMNH). *Halifax Co*., 11.2 km (7.0 mi) N South Boston, F, and Staunton River State Park, F, juv. 14 September 1988, R. M. Shelley (NCSM); 4.8 km (3.0 mi) E Scottsburg, Difficult Creek Natural

Area Preserve, M, 3 May 2003, R. L. Hoffman (VMNH). *Henry Co*., near Leatherwood, 2M, 2 May 1959, R. L. Hoffman (VMNH); Philpot Lake, 3M, 23 April 1977, D. P. Blackwell, E. G. Kiser (VMNH) and 2M, F, September 2009, M. Rogers (VMNH); Martinsville, Dupont Property, M, F, 25 September–2 October 1995, J. M. Anderson (VMNH), around old VMNH building, M, May 2003, and M, 1 August 2005, R. L. Hoffman (VMNH), and 101 Crescent St., M, 26 October 2009, R. L. Hoffman (VMNH). *Lunenburg Co*., 6.4 km (4.0 mi) NW Lunenburg, 2M, F, 15 September 1988, R. M. Shelley (NCSM); and Reedy Creek at Love's Mill, F, 9 May 1988, R. L. Hoffman (VMNH). *Mecklenburg Co*., 3.2 km (2.0 mi) SE Boydton, M, 25 June 1950, J. C. Mitchell (VMNH); 1.6 km (1.0 mi) N Norvelle, M, F, 6 June 1950, J. C. Mitchell (VMNH); Occoneeche State Park, MM, FF, 18 June 1982, C. A. Paquet, B. J. Larson (VMNH); 6.4 km (4.0 mi) NE South Hill, along VA hwy. 138 at Meherrin River, 2M, 2F, 15 September 1988, R. M. Shelley (NCSM); Elm Hill Wildlife Management Area at J. H. Kerr Dam, MM, FF, 16 April 1988, R. L. Hoffman (VMNH); and 4.8 km (3.0 mi) N South Hill, along VA hwy 657 at Meherrin River, M, 7 April 1990, R. L. Hoffman (VMNH). *Patrick Co*., along Smith River near Charity, M, May 1986, R. L. Hoffman (VMNH). *Pittsylvania Co*., Solite Quarry NE of Eden, NC, M, 8 June 1958, K. Pfaff (VMNH); 6.4 km (4.0 mi) W Whitmell, M, F, 6 May 1989, R. L. Hoffman (VMNH); Cascade Creek at VA hwy 650, M, 20 May 1989, R. L. Hoffman (VMNH); 1.6 km (1.0 mi) N Axton, Lacy Farm, MM, 15 June–14 July 1992 (VMNH); 6.4 km (4.0 mi) ENE Axton, MM, FF, 14 July–13 September 1992 (VMNH); and 1.6 km (1.0 mi) S Gretna, M, May 2003, C. P. Thornton (VMNH). *Prince Edward Co*., Farmville, M, 14 July 1975, W. A. Shear (VMNH) and Price Drive, M, 20 July 1994, J. K. Shear (VMNH); Rice, Rhines Farm, M, 17 June 1981, Z. G. Bellinger (VMNH); 20.8 km (13.0 mi) S Farmville, M, 10 April 1994, W. A. Shear (VMNH); Twin Lakes State Park, 3M, F, 11 September 1988, R. M. Shelley (NCSM). *Southampton Co*., 5.3 km (3.3 mi) SE Bailey, M, 6 June 1983, C. A. Paguet, D. A. Young (VMNH). *Surry Co*., 9.6 km (6.0 mi) N Surry, M, 10 April 1947, R. L. Hoffman (NMNH); and 11.2 km (7.0 mi) NW Surry, Pipsico Scout Reservation, 2F, 14 July 1968 (MCZ). *Sussex Co*., 4.8–8.0 km (3.0–5.0 mi) E Wakefield, edge of Blackwater Swamp, M, F, 22 November 1967, D. L. Brittle (VMNH). *City of Suffolk*, along US hwy. 58 at Magnolia, M, 4 May 1956, R. H. Hager (VMNH).

**Remarks.** Say (1821) stated that *J. virginiensis* was rather common, appeared to be synonymous with "*J. tridentata*," and was "destitute of the robust ventral spines between the feet," which we interpret as sternal lobes. This statement does not place *virginiensis* in *Apheloria*, but it does negate association with *P. flavipes*, which has conspicuous sternal lobes. Consequently, the fact that *virginiensis* is not *P. flavipes* was stated in the earliest days of American diplopodology and only 51 years after Drury (1770) established the name, but authors beginning with Wood (1865) either ignored it or were unaware of it.

Chamberlin's gonopod illustration of the type of *A. tigana* (1939, pl. 4, fig. 29) shows a small and short prefemoral process, but RMS' examination of the dissected appendage revealed it to be subequal to that in the *J. virginiensis* neotype. Additionally, some males of *A. v. virginiensis* possess small, indistinct basal tubercles or pustules on the inner acropodital surface.

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